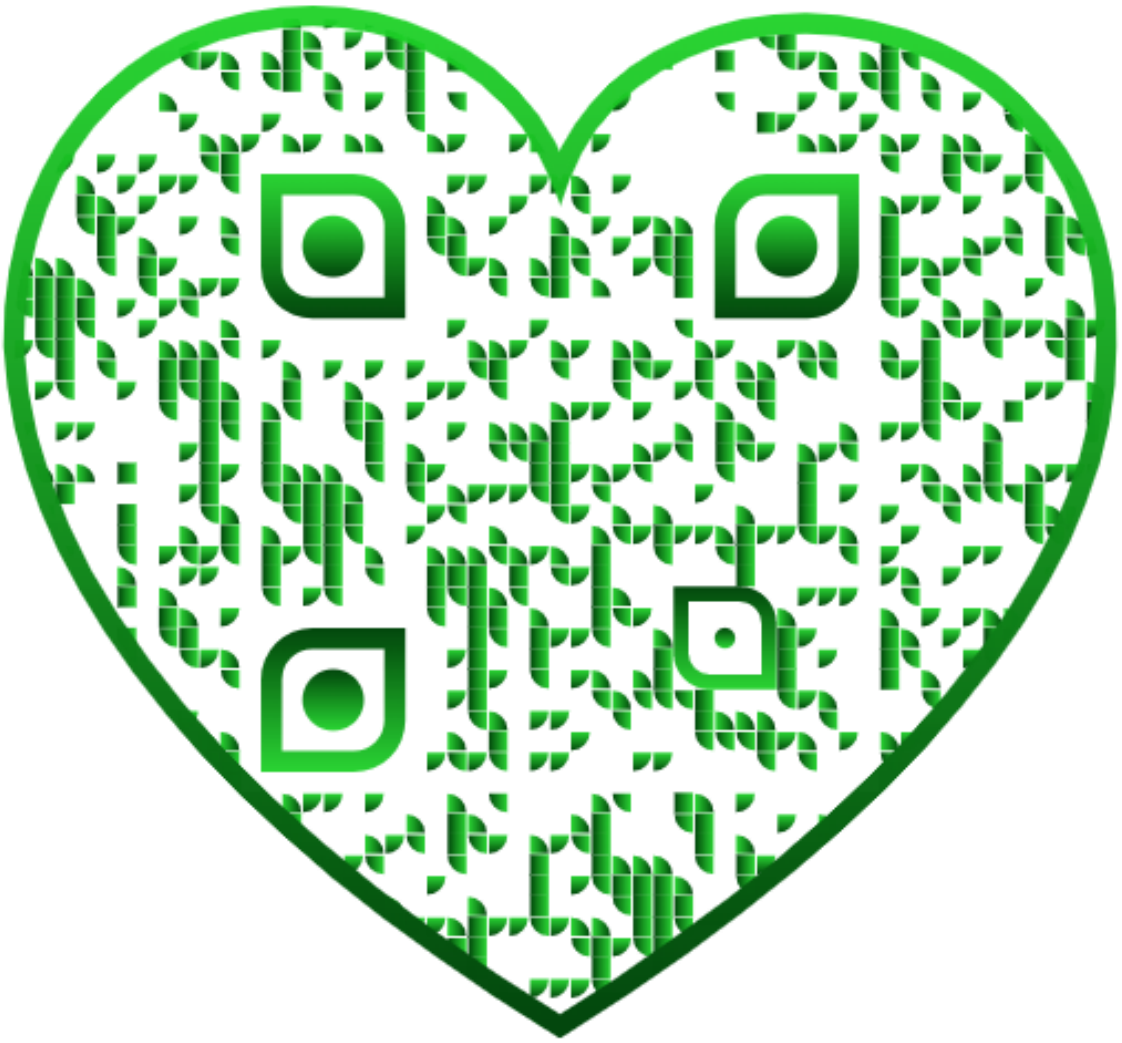
Magnesium Test



# Magnesium

- $4^{th}$ most abundant cation in the body and $2^{nd}$ most abundant intracellular cation.
- 53 % of Mg found in the bone, 46 % in muscle and tissue, <1%  is present in the serum.
- The Mg circulating in serum is in the bound form (one third-bound to albumin),  of the remaining two thirds- (61%) is in the free or ionized form, 5 % bound to phosphate and citrate.
- Free form is physiologically active.

# Regulation of Magnesium

- Regulated by dietary intake, intestine may absorb 20-65 % of dietary intake and body needs.
- Kidneys regulate absorption and excretion of Mg.
- PTH increases the renal reabsorption of Mg

# Clinical Significance

- Roles in the body:
  - Myocardial rhythm and contraction
  - Cofactors in enzyme activation
  - Regulation of ATPase ion pump
- Abnormal levels related to cardiovascular, metabolic, and neuromuscular disorders.
- Reference range: 1.7-2.2 mg/dL (milligrams per deciliter)

# Hypo- & Hypermagnesaemia

- Hypomagnesaemia:
  1. Reduce intake
  2. Decreased absorption
  3. Increased excretion

- Hypermagnesaemia caused by:
  1. Decreased excretion
  2. Increased intake

# Electrolyte Relationships

- Sodium / Potassium – inverse
  ↑ $Na^+$ = ↓ $K^+$
- Calcium / Phosphorus = inverse
  ↑ $Ca^+$ = ↓ $PO_4$
- Calcium / Vit D = similar
  ↑ $Ca^+$ = ↑ Vit D
- Magnesium / Calcium = similar
  ↓ Mg = ↓ $Ca^+$
- Magnesium / Potassium = similar
  ↓ Mg = ↓ $K^+$
- Magnesium / Phosphorus = inverse
  ↓ Mg = ↑ $PO_4$

Thank
you!!